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EXAMINER

SNYDER, DAVID A

ART UNIT

PAPER NUMBER

2122

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/608,616

Applicant(s)

BHARADWAJ ET AL.

Examiner

David A Snyder

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Oath/Declaration*

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: the Oath/Declaration is not signed or dated by the inventors.

It was not executed in accordance with either 37 CFR 1.66 or 1.68.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "package 210" of pg. 9, ll. 13. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "525" (pg. 12, ll. 11) and "530" (of Fig. 5) have both been used to designate "build profile database" in the specification and drawing respectively. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: item 110 of Fig. 1; item 620 of Fig. 6; items 965, 970, 975, and 980 of Fig. 9; items 1320, and 1330 of Fig. 13; and items

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1410, 1415, 1420, 1425, and 1430 of Fig. 14. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

5. Claims 6, 16, and 26 are objected to because of the following informalities: the dependency of claims 6, 16, and 26 cannot be back to itself. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 5, 15, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claims 5, 15, and 25, as applied to claims 4, 14, and 24 below, the phrase, “using annotations in a high level representation of an executable program which relate portions of the executable to the high level representation,” is unclear to the Examiner. According to claims 2, 12, and 22, a program is a copy of “an intermediate representation of a source file to the target machine.” Is the “high level representation” of claims 5, 15, and 25 the “intermediate representation” of claims 2, 12, and 22? Also, as the application is taken as a whole, how are the annotations “in a high level representation of an executable program” to be “implemented as a linked list of data structures” (pg. 16, ll. 16 – 17)? As one of ordinary skill in the art is aware, a “high level representation” of a

program is a source code (or, according to the Applicant, intermediate representation) file stored as a flat-file, and a linked list is a data structure stored in the dynamic environment of the memory. How are the memory-based data structures of the linked list expressed in the flat-file form of the high level representation?

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 1 – 4, 11 – 14, and 21 – 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Adl-Tabatabai (USPN 6,170,083).

As per claims 1, 11, and 21, Adl-Tabatabai teaches/discloses “installing a program onto a target machine (Adl-Tabatabai, “a user first . . . download[s] the desired Jaa class file into a client computer system . . . ,” col. 2, ll. 53 – 57);

Adl-Tabatabai also teaches/discloses “executing the program” (Adl-Tabatabai, “where the Java class file is then executed,” col. 2, ll. 53 – 57);

Adl-Tabatabai also teaches/discloses “responsive to change in profile data collected while the program executes which exceeds a predetermined threshold, recompiling the program” (Adl-Tabatabai, “if the execution path counter does exceed the threshold value then . . . an optimizing compiler generates an optimized set of code,” col. 6, ll. 57 – 61).

As per claims 2, 12, and 22, as applied to claims 1, 11, and 21 above, Adl-Tabatabai teaches/discloses “installing a continuous compiler” (Adl-Tabatabai, Fig. 3, item 333, the Just-In-Time compiler would have to be installed in order to use the Just-In-Time compiler);

Adl-Tabatabai also teaches/discloses “installing a runtime monitor” (Adl-Tabatabai, “the method introduces instrumentation code into the object code that performs path profiling,” col. 2, ll. 1 – 3);

Adl-Tabatabai also teaches/disclose “copying an intermediate representation of a source file to the target machine” (Adl-Tabatabai, “a Java class file is downloaded into a local client computer system,” col. 3, ll. 64 – 65);

Adl-Tabatabai also teaches/discloses “building a profile database” (Adl-Tabatabai, “the Just-In-Time compiler 333 introduces instrumentation code . . . that counts and determines which basic block is being executed,” col. 6, ll. 11 – 15);

Adl-Tabatabai also teaches/discloses “compiling the intermediate representation to create an executable file” (Adl-Tabatabai, “that region of code is compiled into native processor code,” col. 4, ll. 32 – 35).

As per claims 3, 13, and 23, as applied to claims 1, 11, and 21 above, Adl-Tabatabai teaches/discloses “running an executable version of the program” (Adl-Tabatabai, “the Java Virtual Machine then begins to execute the code,” col. 4, ll. 26 – 28);

Adl-Tabatabai also teaches/disclose “collecting samples of process information at a controlled rate” (Adl-Tabatabai, “an execution path counter associated with the folded execution path counter . . . is incremented,” col. 6, ll. 23 – 25);

Adl-Tabatabai also teaches/discloses “generating binary level and high level profiles” (Adl-Tabatabai, “that followed execution path is optimized,” col. 6, ll. 26 – 28).

As per claims 4, 14, and 24, as applied to claims 1, 11, and 21 above, Adl-Tabatabai teaches/discloses “recompiling further comprises customizing compiler optimizations based on profile data generated during program execution” (Adl-Tabatabai, “that execution path is optimized . . . [and o]ther optimization techniques . . . may be used,” col. 6, ll. 26 – 28).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the

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inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

10. Claims 1, 2, 11, 12, 21, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Hölzle et al. (USPN 5,970,249; hereafter referred to as Hölzle).

As per claims 1, 11, and 21, Hölzle teaches/describes “installing a program onto a target machine” (Hölzle, “Byte codes 144 are provided as input to a computer system 146 at run-time,” col. 4, ll. 27 – 28);

Hölzle also teaches/discloses “executing the program” (Hölzle, “byte codes 144 may be provided by a compile-time environment with a virtual machine to a run-time environment,” col. 4, ll. 31 – 34);

Hölzle also teaches/discloses “responsive to change in profile data collected while the program executes which exceeds a predetermined threshold, recompiling the program (Hölzle, “When the number of times a method is interpreted exceeds a threshold, . . . the method may be compiled using compiler 150,” col. 4, ll. 55 – 57). Hölzle also teaches/discloses the “recompiling the program while the target machine is idle” (Hölzle, “During such periods of low activity, . . . compilations of methods which have previously been identified . . . are to be compiled,” col. 4, ll. 16 – 19).

As per claims 2, 12, and 22, as applied to claims 1, 11, and 21 above, Hölzle teaches/discloses “installing a continuous compiler” (Hölzle, “for use in computer systems that are arranged to execute both interpreted and compiled byte codes,” col. 2, ll. 30 – 33);



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Hölzle also teaches/discloses “installing a runtime monitor” (Hölzle, “a measure of how many times a method is interpreted is maintained,” col. 4, ll. 46 – 48);

Hölzle also teaches/disclose “copying an intermediate representation of a source file to the target machine” (Hölzle, “Byte codes **144** are provided as input to a computer system **146** at run-time,” col. 4, ll. 27 – 28);

Hölzle also teaches/discloses “building a profile database” (Hölzle, “compilations . . . [are] obtained from two sources, a database list and an execution list . . . [o]ne system which is capable of creating a database list . . . [and a]n execution list . . . is created during the current execution of the program,” col. 6, ll. 36 – 56);

Hölzle also teaches/discloses “compiling the intermediate representation to create an executable file” (Hölzle, “Compiler **642** then generates machine instructions from byte codes **630**, and executes the machine-language instructions,” col. 12, ll. 6 – 8).

### ***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 6 – 10, 16 – 20, and 26 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of Adl-Tabatabaia and Hölzle.

As per claims 6 – 10, 16 – 20, and 26 – 30, as noted in the Applicant’s specification, “[the] annotations can be implemented as a linked list of data structures. Handling of linked lists is routine in the art . . .” (pg. 16, ll. 16 – 18). The claims of 6 –

10, 16 – 20, and 26 – 30 are, to one of ordinary skill in the art, clearly the handling or creation of nodes on a linked list. The manipulation and modification of the nodes on a linked list or the linked list itself is old and well known in the art. Thus, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art on how to handle a linked list if the annotations were to be made as nodes on a linked list.

### *Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Iitsuka et al., "Method of Recompiling a Program by Using Result of Previous Compilation" (USPN 5,230,050), Buzbee, "Use of Dynamic Translation to Collect and Exploit Run-time Information in an Optimizing Compilation System" (USPN 5,815,720), Goodwin et al., "User Transparent Mechanism for Profile Feedback Optimization" (USPN 6,158,049) all disclose the use of dynamic compilation for the optimization of a program. The above-mentioned patents do not expressly disclose the recompilation of a program during a computer's processing slow down. However, it is old and well known in the art that the processing of background processes/threads should be done only when the processing of the background process/thread "allows for the efficient usage of overall system resources, and, typically, does not cause delays which are noticeable to a user" (Hölzle, col. 4, ll. 19 – 23). The two ACM papers, "Annotation-Directed Run-Time Specialization in C", by Brian Grant et al., and "Fast, Effective Dynamic Compilation", by Joel Auslander et al. also teach the use of dynamic compilation.

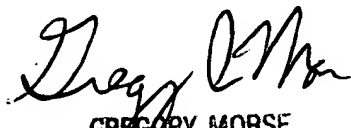
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A Snyder whose telephone number is (703) 305-7205. The examiner can normally be reached on Monday - Friday from 9am - 5pm Eastern Time.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg A Morse can be reached on (703) 308-4789. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

dAs  
February 6, 2003

  
GREGORY MORSE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100